

Follow-up Surveys of Radiation Anomalies Identified by  
Surface Gamma-Ray Surveys in Valencia County, New Mexico

Twenty-five radiation anomalies were identified on the Pueblo of Laguna tribal lands by a gamma-ray scanning device driven about the villages on September 6, 1980. Nine villages were surveyed - Casa Blanca, Laguna, Laguna Subdivision West, Mesita, New Laguna, New York, Paguete, Paraje, and Seama. The anomalies are listed in the accompanying table entitled "Mobile Radiation Survey Anomaly Report, Valencia County, New Mexico." Each of the sites was revisited by a radiation survey team during the week of February 9, 1981.

When detailed follow-up surveys were made, background levels of radiation were established by selecting three locations about 0.5 miles outside each village where the terrain, soil, and elevation represented the terrain, soil, and elevation of the village.

The accompanying table entitled "Anomaly Follow-up Report, Valencia County, New Mexico" shows the findings of our on-site surveys. The following predefines terms used in the table:

HIG	high indoor gamma
LOG	low outside gamma
HOG	high outside gamma
Revisited	briefly visited; because of the type of source or structure, no detailed survey was necessary.

Anomaly Follow-up Report, Valencia County, New Mexico

<u>Event</u>	<u>Remarks</u>
1	Laguna Tribal Offices, extensively surveyed for gamma radiation HIG = 14 $\mu$ R/hr.
2	Revisited
3	Revisited
4	Revisited
5	Revisited
6	Revisited
7	Revisited
8	Revisited
9	<p>This stucco/adobe structure is a duplex which was inhabited by the families of (b) (6) and (b) (6). The home was surveyed inside and out for gamma sources using a pressurized ion chamber. In the (b) (6) home, HIG = 14.4 <math>\mu</math>R/hr and in the (b) (6) home, HIG = 15.7 <math>\mu</math>R/hr.</p> <p>LOG = 12.6 <math>\mu</math>R/hr, HOG = 37.6 <math>\mu</math>R/hr. ✕</p> <p>A piece of petrified wood was identified as the source. Inside, radon-daughter working levels were measured at 0.0093 and 0.019 in the kitchen and bedroom, respectively, of the (b) (6) home. Radon levels were measured at 2.2 and 5.0 pCi/l on February 11, 1981. Alpha-track detectors were left in the homes from February 11, 1981, until June. The average radon levels recorded were:</p> <p>(b) (6) home = <math>2.7 \pm 0.2</math> pCi/l (b) (6) home = <math>4.8 \pm 1.6</math> pCi/l</p> <p>Given the equilibrium values measured on February 11, 1981, these related to about 0.01 and 0.018 working levels.</p>

<u>Event</u>	<u>Remarks</u>
10	Scintillometer survey, no access to adobe barn, HOG = 21, LOG = 10 $\mu$ R/hr
11	Scintillometer survey, HOG = 32, LOG = 10 $\mu$ R/hr. ✕ The source was found to be a rock.
12	Scintillator survey, HOG = 12, LOG = 12 $\mu$ R/hr.
13	Scintillator survey, HOG = 12, LOG = 12 $\mu$ R/hr.
14	Scintillator survey, HOG = 10, LOG = 9 $\mu$ R/hr.
15	Scintillator survey, HOG = 12, LOG = 12 $\mu$ R/hr.
16	Revisited
17	Scintillometer survey, HOG = 600, LOG = 10 $\mu$ R/hr. ✕ This hot spot of soil by an old shed is said to have been the location of a large rock. Presumably the rock eroded and left behind contamination. The location of the rock is not known. Radionuclides present in the soil on February 11, 1981, were: <div style="margin-left: 40px;"> Radium 226            607 <math>\pm</math> 2.8 pCi/g ✕  Uranium 235           62 <math>\pm</math> 4.9 pCi/g  Potassium 40        13 <math>\pm</math> 4.6 pCi/g </div>
18 and 19	New Laguna Jr. and Sr. High School Extensively gamma surveyed; no unusual activity, HOG = 16, LOG = 11 $\mu$ R/hr.
20	(b) (6) home was gamma surveyed using a pressurized ion chamber; HOG = 15.7, LOG = 11.1 $\mu$ R/hr. Radon and working level measurements were made in her living room and bedroom on February 12, 1981. Those levels were 3.37 pCi/l and 0.0074 WL and 2.16 pCi/l and 0.0083 WL for the respective measurements in the respective rooms. Alpha-track dectectors were placed in the home on February 12, 1981, and recovered June 4, 1981. The average radon level from three detectors was 3.3 $\pm$ 0.2 pCi/l. Using the equilibrium value measured for her bedroom on February 12, 1981, this relates to about 0.01 working levels.

<u>Event</u>	<u>Remarks</u>
21	(b) (6) home was gamma surveyed; HOG = 12, LOG = 10 $\mu$ R/hr.
22	(b) (6) home was gamma surveyed; HOG = 12, LOG = 9 $\mu$ R/hr.
23	(b) (6) home was gamma surveyed; HOG = 12, LOG = 9 $\mu$ R/hr.
24	This rock pile was surveyed with hand-held instruments. The majority of the radiation was coming from one rock which measured 3 mR/hr on contact. The rock was removed.
25	This structure is probably local material which when presented over a much larger portion of the detectors field of view yields a higher reading. Background is recorded on horizontal ground. The underpass would present a large fill of earth vertically to the detector.

---

Conclusion

"The final (inactive uranium mill) standard requires cleanup of contamination only when the amount and location of tailings poses a clear present or future hazard and provides criteria to assist in this determination." Based on those criteria, since no specific criteria exists for mine waste or for naturally-occurring radioactivity, none of the structures surveyed on the Pueblo of Laguna in Valencia County, New Mexico, present a hazard to human health.

Event 17, 600  $\mu$ R/hr and 600 pCi/g of Ra-226, is small and not likely to be inhabited. It may be considered a nuisance but should not cause alarm. Radiation levels in the residences were found to be representative of other areas in the Colorado Plateau.

---

---

---

---

---

---

---

---

---

---



MOBILE RADIATION SURVEY  
ANOMALY REPORT

Valencia County, New Mexico

Date	Event No.	Map No.	Rep. Chart No.	Tape No.	Address or Location	Bkg γ CPS	Peak γ CPS	Comment
9-6-80	1		22		Community Bldg. (Tribal Offices)	200	265	Laguna, N.M.
9-6-80	2		22		Railroads Tracks	225	300	Paguate Reservoir, N.M.
9-6-80	3		22		Road fill to Dike	225	335	Paguate Reservoir, N.M.
9-6-80	4		22		Dike for Dam	225	310	Paguate Reservoir, N.M.
9-6-80	5		22		West of Dike, Below Event 3	275	375	Paguate Reservoir, N.M.
9-6-80	6		22		South Side of Questa Hill	275	1000 +	Road to Paguate, N.M.
					(Open Area)			
9-6-80	7		22		Mine Area	275	450	Jackpile Mine, N.M.
9-6-80	8	28	22		Land Fill	250	400	Paguate, N.M.
					Labled as "A" on Map Land Fill			
9-6-80	9	28	22		Petrified Wood near door of	250	725	Paguate, N.M.
					house - "B" on map (b) (6)			
9-6-80	10	28	22		"C" on map Barn by Nazarene Church	275	370	Paguate, N.M.
9-6-80	11	28	22		"D" on map - Readings from inside	275	640	Paguate, N.M.
					garage Rock under mail box (b) (6) residents			
9-6-80	12	28	22		"E" on map - Shed (b) (6)	250	330	Paguate, N.M.
9-6-80	13	28	22		"F" on map - Barn (b) (6)	260	315	Paguate, N.M.
9-6-80	14	28	22		"G" on map House on point of Mesa	250	290	Paguate, N.M.
9-6-80	15	28	22		"H" on map Can not identify	270	385	Paguate, N.M.
9-6-80	16		22		Shine from mine	250	350	Jackpile Mine, N.M.
9-6-80	17		22		low shed - by old hotel	300	350	On road to New Laguna, N.M.
					West of Old Hotel Wayne Dailey			
					Soil sample taken.			

INSTRUMENTS  
1 & 2

CONFIDENTIAL

POL-EPA01-0001702

MOBILE RADIATION SURVEY  
ANOMALY REPORT

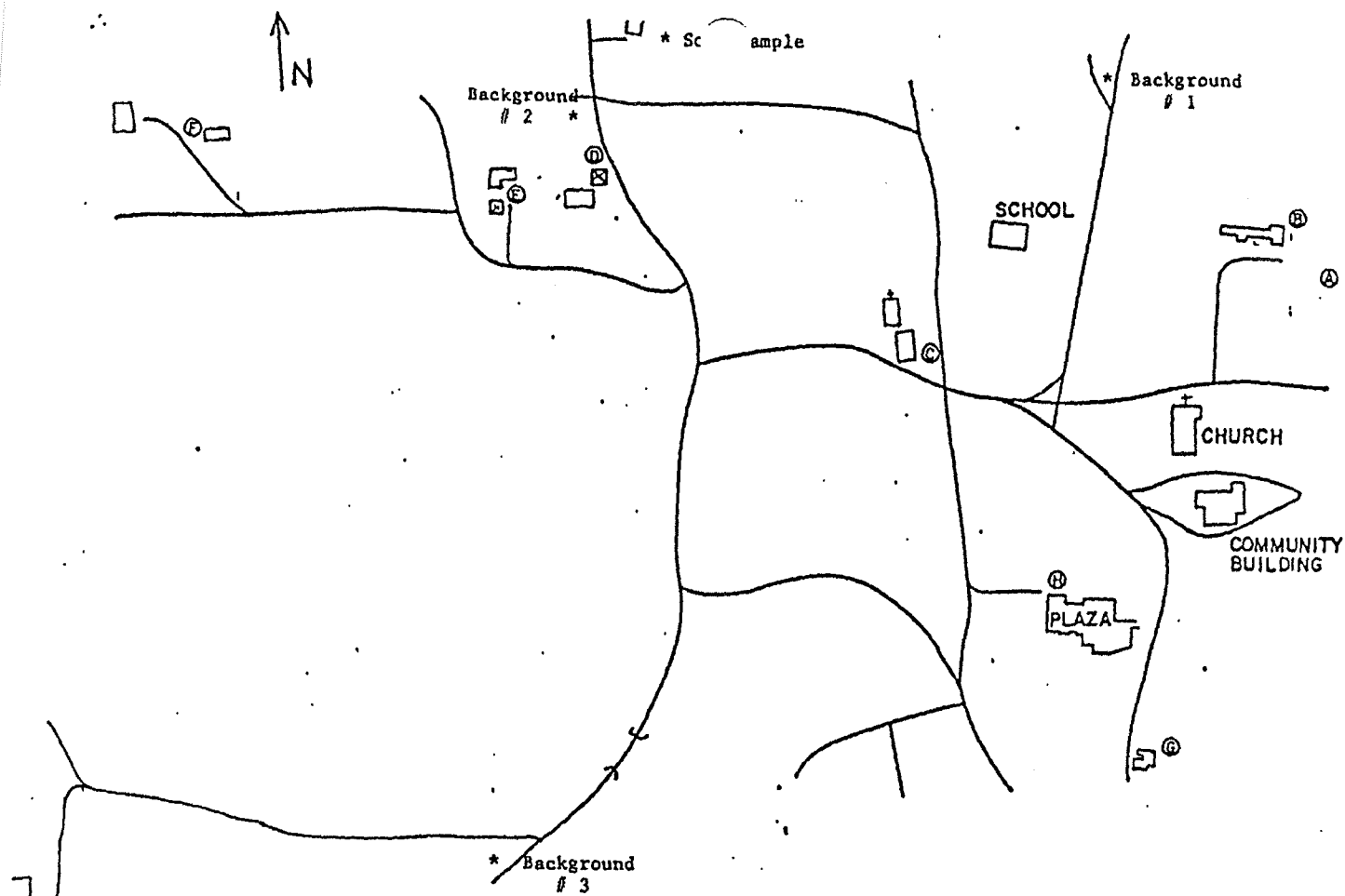
Valencia County, New Mexico

[illegible]

0712 1343  
4 4 43

CONFIDENTIAL

POL-EPA01-0001703

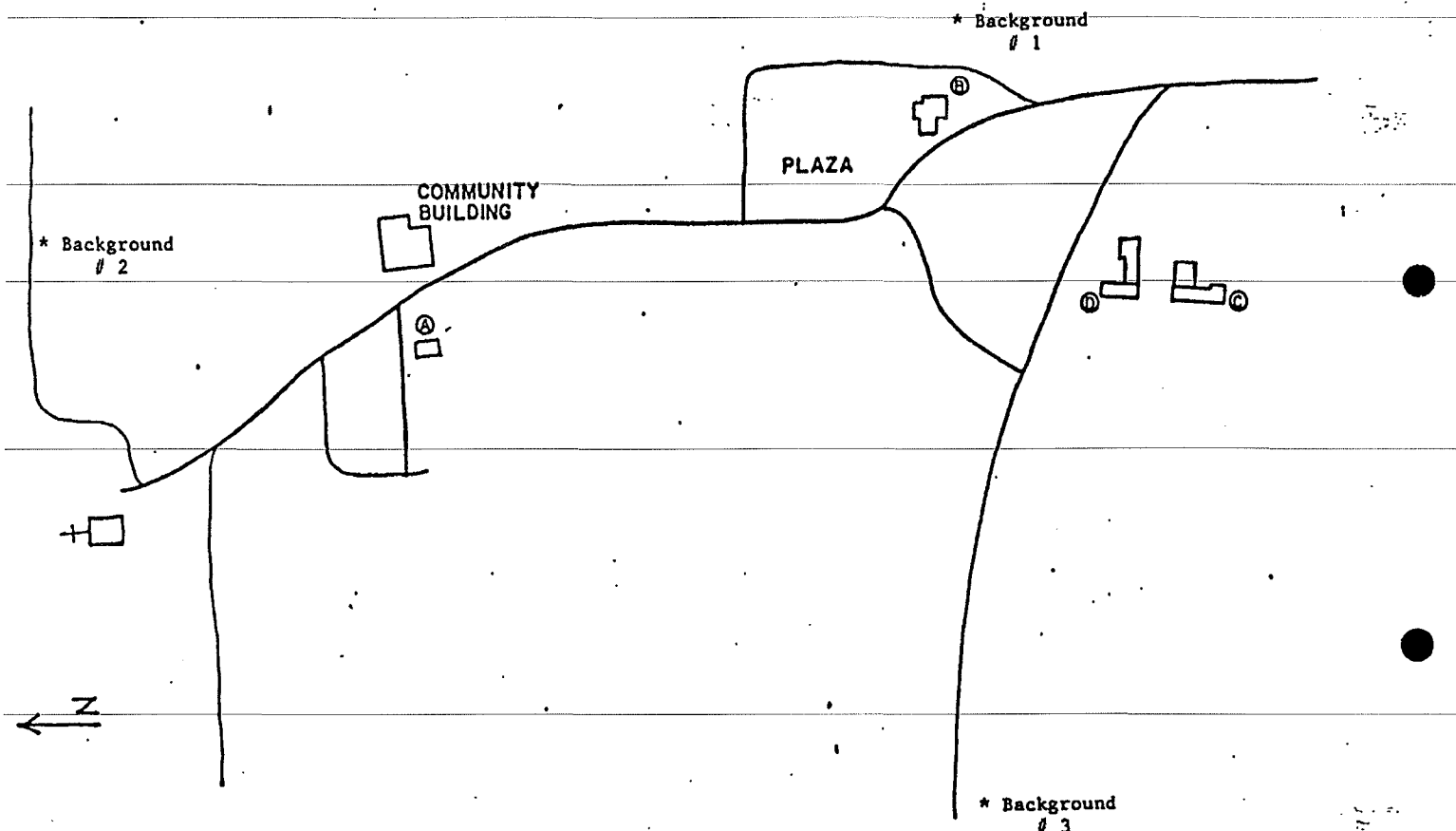


MAP 28 - PAGUATE, NEW MEXICO

CONFIDENTIAL

POL-EPA01-0001704





MAP 29 - PARAJE, NEW MEXICO

CONFIDENTIAL

POL-EPA01-0001705